

REMARKS

Applicant submits that the present amendment is intended to be fully responsive to the Office Action having a mailing date of March 20, 2003. In view of the Office Action, Applicant has amended claims 1-3, 5-8 and 12 and has cancelled claim 11. Applicant submits that no new matter has been added by this amendment and support for the claims may be found throughout the specification and drawings as filed.

As amended, claim 1 of the present invention embodies a method of controlling a computer game comprising the steps of imaging a sequence of scenes including the head of a user of a computer; comparing visual characteristics from a portion of a scene to a center of said portion of a scene to determine movement of the user's head within the scene wherein at least one of the visual characteristics is color; finding a weighted average of color to compute the location of the user's head based upon color alone; and controlling the game in accordance with the movement of the user's head.

35 U.S.C. §112

Claims 1-12 are rejected under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Applicant submits that claims 1, 4, 5 and 6 have all been amended to put the claims in better condition for allowance with regard to the rejections made under 35 U.S.C. §112, second paragraph. As such, Applicant respectfully requests reconsideration and that this be withdrawn as a basis for rejection.

35 U.S.C. §102

Claims 1-9 and 12 are rejected under 35 U.S.C. §102(e) as being anticipated by Holliman et al., U.S. Patent No. 6,075,557.

Holliman et al. discloses an image-tracking system which is configured to present a sequence of images, to determine the position of a target image and a previously presented image, to determine the movement of the target image between the previously presented image and the subsequently presented image, and to indicate the position of the target image and the subsequently presented image as the aforementioned determined position modified by the determined movement.

It is appreciated that in order to sustain an anticipation rejection, a cited reference must disclose every element of the claimed invention.

Claim 1 has been amended to provide a method of controlling a computer game comprising a step of finding a weighted average of color to compute the location of a user's head based upon color alone and controlling the game in accordance with movements of the user's head. Applicant submits that the Holliman et al. reference does not disclose a method of controlling a computer game that includes a step of finding a weighted average of color to compute the location of the user's head as according to the present invention. Accordingly, Applicant submits that the '557 reference should not be used to form the basis of an anticipation rejection and as such respectfully requests that this be withdrawn as a basis for rejection.

35 U.S.C. §103

Claims 10, 11 and 13 are rejected under 35 U.S.C. §103(a) as being unpatentable over Holliman et al. in view of Birchfield.

Birchfield teaches a method for object tracking that combines the output of two different modules: one that matches the intensity gradients along the object's boundary, and one that matches the color histogram of the object's interior.

The color module of the Birchfield method considers the color of a human head to be complex and being at the very least bimodal due to the usually contrasting colors of the skin and hair. The reference uses a color histogram in its method for target tracking because of the ability of the color histogram to inclusively capture complex, multi-modal patterns of color of the kind.

The Birchfield method goes on to teach the computation of a histogram intersection between a model histogram and an image histogram at each hypothesized location of the user's head. The Birchfield reference asserts that the power of the histogram intersection results from the $\text{MIN}()$ function, which matches no more image pixels of a certain color that are present in the model histogram. Thus, for example, the measure of accuracy for object tracking is more satisfied within a region containing both facial and hair color than a region containing all facial color.

It is appreciated that in order to sustain an obviousness rejection, the cited references must teach or suggest every element of the claimed invention.

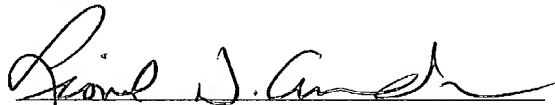
By this amendment, claim 1 now recites a method of controlling a computer game that comprises a step of finding a *weighted average of color* to compute the location of a user's head based upon color alone. Applicant submits that this limitation is not taught or suggested by a combination of the cited references. Birchfield teaches using the $\text{MIN}()$ function to determine the histogram intersection between a model histogram and an image histogram for object tracking based on color alone. Applicant

submits that using a weighted average of color to compute the location of a user's head based upon color alone would not have been obvious to one of skill in the art in view of the combination of Holliman et al. and Birchfield wherein the only computation suggested to achieve such a result is the MIN() function. Accordingly, Applicant respectfully requests reconsideration of the claims as amended and that this be withdrawn as a basis for rejection.

Applicant submits that claims 2-10, 12 and 13 depend from amended independent claim 1 which is believed to be in condition for allowance in view of the cited references. Accordingly, they also are believed to be in condition for allowance and reconsideration is respectfully requested.

From the foregoing amendments and remarks, Applicant believes that the claims of the present invention embody patentable subject matter and such action toward these ends is respectfully requested.

Respectfully submitted,



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